

Final Report by the Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group

19 November 2003

The Economics Sub-Committee to the Comprehensive Solid Waste Management Plan Working Group presented its Interim Report to the Working Group in February 2003, with the understanding that a more complete analysis incorporating the recommendations of other sub-committees would be submitted near the end of the process. The analysis presented here is divided into two sections. Section I compiles recommendations made by the Economics and other sub-committees and includes an assessment of the impacts of these recommendations on landfill life. Section II includes recommendations by the Economics sub-committee that were not included in the Interim report and suggests an implementation schedule to coordinate all incentive strategies.

I.

MUNICIPAL INCENTIVES

Pay-as-you-throw strategies:

Economic theory suggests that to attain the optimal level of demand for waste services, individuals must bear directly the full cost of waste services. Absent this internalization of full costs, traditional systems (taxes) for financing waste collection lead to inefficiently high levels of waste production because of the disjoint between the cost of services and how they are paid. Pay-as-you-throw (PAYT) strategies, which tie costs to the amount of waste disposed, create a direct link between waste disposal and cost and support the waste management hierarchy (Source Reduction sub-committee). PAYT strategies were recommended by three sub-committees (Economics, Municipal Recycling and Source Reduction).

The analysis conducted here is based on estimates made by the Tellus Institute that *on average* project a 5 percent source reduction and 20 percent reduction in waste disposed by increased recycling, based on the average experience with PAYT in over 100 Massachusetts communities.¹ While we expect that some Rhode Island communities will not achieve this level of reduction and others will exceed it, we believe that the average should be similar to that achieved in Massachusetts.

The table at the top of page two estimates the changes that would have resulted if PAYT strategies had been implemented in 2002 in landfill economics (landfill revenue), capacity (how much time does it buy in terms of capacity) and municipal.

It is important to note that while *total* waste generation is expected to increase at approx. 2%/yr. because of population and per capita waste generation increases, *comparable* results from implementation of PAYT strategies may be assumed for the future as the *relative* differences will be approximately the same between business as usual (BAU) and various PAYT projections.

¹ A study conducted for the EPA in March 1996 supports this having found in general, communities adopting PAYT programs reported an average reduction in waste landfilled of 28 percent, with a range of 25 percent to 50 percent.

(tons)	BAU (Business as Usual)	% of waste	25% Diversion rate	% of waste
Recycling	83,716	16	173,630	34
Refuse	449,570	84	337,178	66
Source Reduction	0		22,479	
Total waste	533,287		510,808	
The figures used in this table are based on Municipal waste and recycling numbers for 2002 expected to appear in Part 5 of the new Comprehensive Solid Waste Management Plan.				

The results of full PAYT implementation are projected to be a diversion of 112 kilotons (KT) from the landfill and reduced RIRRC revenues of \$1.35M (at the \$32/T municipal tip fee, offset by \$20/T operating costs). (See Note on calculation of Operating Costs, below). Since the present value of landfill space is estimated as ca. \$40/T (see section on Value of Landfill Space, below), and reductions are achieved by PAYT at a net loss of revenue of only \$12/T, in the long run, it should be economically prudent for RIRRC to implement PAYT programs, as long as the additional cost of implementation does not exceed \$28/T. Cash flow issues are, of course, another matter.

For the past five years, recycling has been close to a breakeven operation, independent of the volumes recycled (income has exceeded costs/ton recycled for the years 1998 to 2003 on average by \$6/T). However, it is very likely that the MRF would need to be expanded to handle an increase in volume of over 100 percent (~ 90 KT).² Since current recycling revenues cover the cost of the existing facility, it might be reasonable to assume that also will be the case for the expanded facility, but lacking estimates of the cost of expansion, we can't confirm that assumption. Also, see the proposal to stop glass recycling in the Proposed Strategies section at the end of this document for a suggestion on how to reduce the cost of MRF operations and the cost to municipalities of collecting recyclables.

As the annual amount of waste disposed at the landfill ranges from 1.05 to 1.1 million tons/year, the PAYT measure, if fully implemented, is predicted to extend landfill life by over 1.5 months each year – that is, in 8 years, landfill life would be increased by an additional year.

An analysis similar to that conducted above has been carried out to assess the effect of PAYT programs on costs in four municipalities. The collection and hauling costs are *average* costs reported in a survey conducted by RIRRC of municipalities in Rhode Island earlier in 2003. (Note that the use of average costs does not capture any economies of scale from increased recycling, and may therefore overpredict cost increases and underpredict cost savings.)

² According to Patrick Fingliss, the existing MRF is not equipped to handle an increase of this magnitude and in order to handle ~90 KT of additional material, there would have to be a major retrofit of the MRF's processing systems, buildings and grounds. The existing MRF was designed only to handle the materials collected in the Maximum Recycling Program.

The MRF has two processing systems – one for bottles and cans and one for paper. The MRF's bottle and can processing system is at capacity and presently operates 16 processing hours a day, 5 days a week and the paper processing system is at approximately 55 percent of capacity assuming 8 processing hours a day, 5 days a week. The yearly capacity of the present MRF operating 16 hours a day, 5 days a week is approximately 34,000 tons yearly for bottles and cans and approximately 93,600 tons yearly for paper. The composition of the material and the products to be sorted and marketed are extremely important in any discussion of capacity.

The following table estimates the reductions in the amount of waste that would have been landfilled if PAYT strategies had been implemented in 2002.

	Barrington	Cranston	East Providence	North Smithfield
BAU (in tons)				
Recycling	2,425	7,470	4,550	1,300
Refuse	6,660	33,990	19,800	4,475
PAYT (in tons)				
Recycling	3,755	14,045	8,510	2,190
Refuse	4,950	25,045	14,850	3,355
<u>Tons diverted by PAYT</u>	<u>1,710</u>	<u>8,945</u>	<u>4,950</u>	<u>1,120</u>
%age increase or (decrease) in <i>overall</i> costs	(2%)	(5%)	11%	1%
2002 figures (collected in 2003 RIRRC survey)				

Grants to defray start-up PAYT costs

The RIRRC budgeted \$480K in FY 2004 to fund start-up costs for any municipality that initiates PAYT, but as yet no municipality has requested this assistance. The Economics sub-committee reiterates the recommendation made in the interim report that RIRRC should provide adequate financial, technical, and in-kind support in the form of grants for municipalities seeking to implement PAYT programs. This recommendation was also made by the Municipal Recycling sub-committee, which suggested that monetary incentives be used to encourage volume-based collection programs, much like the grants in the '80s and early '90s that promoted recycling statewide. At a minimum, grants will need to cover the start-up costs incurred by municipalities electing to implement PAYT. Covering start-up costs will likely be the starting point for a discussion on implementing a new and somewhat politically challenging program and on their own are unlikely to be sufficiently enticing for municipalities.

Municipal Caps:

All existing evidence is that breaking even or projecting a small cost reduction through PAYT will be insufficient to persuade many municipal governments to implement PAYT programs. The Interim Economics sub-committee report recommended that the municipal cap be adjusted to account for the increased recycling that would result from full implementation of PAYT. Under RIGL §23-19-13 (g)(3), the RIRRC has discretion to set a cap on the amount of waste a municipality can dispose of at the municipal rate.

The current caps are set by population and statewide waste generation rates, and then adjusted by a factor to account for reduction by recycling – this was a reduction of 15 percent in 2002 and has recently been changed to 20 percent for FY2004 municipal contracts. We recommend that this cap be *further reduced* by 15 percent in keeping with results expected under PAYT programs, bringing the total reduction to 35 percent. This reduction will need to be phased in over time, so municipalities have the time to put PAYT programs in place. It is recommended

that the municipal caps be reduced from the current 20 percent to 35 percent in 2008, in increments of 5 percent over four years, according to the following schedule.

Year	2002	2004	2006	2007	2008
Cap	15%	20%	25%	30%	35%

The cap reduction should serve as an incentive to municipalities to institute PAYT programs and when implemented in this staggered manner will create incentives for the various municipalities to act at different time periods. An analysis was conducted of the effect of the cap reduction schedule outlined above on the costs of recycling and waste disposal for the 18 municipalities for which accurate information was available from the 2003 RIRRC survey. A municipality is assumed to institute PAYT when the total costs of recycling and waste disposal *increase* relative to 2002 baseline costs (business as usual or BAU). (We note that this assumption of economic rationality may be unrealistic, since willingness and ability to institute a new and potentially controversial program may play a dominant role.) This phase-in schedule has the effect of bringing communities that currently have strong recycling programs and thus are well under their caps into PAYT in the later years. This order of implementation is desirable from a waste-reduction perspective, but would require communities that have shown little progress in waste reduction to take the lead – again, perhaps an unrealistic expectation.

The table below combines the decreasing municipal cap and the start-up funding recommendations. The table shows when municipalities would face overall collection and disposal cost increases as a result of the progressive municipal cap reductions and gives the amount of a start-up grant necessary to cover the cost of bags for the first year of the program. These *approximate* costs are calculated by dividing the total household waste generated by the volume per bag (assumed to be 20 lbs) and then multiplying this figure by the cost per bag (assumed to be \$0.17). If bags are priced to cover the full cost of recycling and waste disposal (including the cost of the bags) these start-up grants will serve as a revolving fund, to decrease the need for up-front investment by the municipality.

Cap	Year	Municipality	Cost of start-up grant from RIRRC*
20	2005	<ul style="list-style-type: none"> • Coventry • Cumberland • East Providence • Foster • North Providence • Pawtucket • Providence • Scituate • Warren • West Warwick 	<ul style="list-style-type: none"> • \$ 190K • \$ 201K • \$ 252K • \$ 24K • \$ 201K • \$ 414K • \$ 1,010K • \$ 60K • \$ 70K • \$ 159K
25	2006	<ul style="list-style-type: none"> • Burrillville • Cranston • North Smithfield 	<ul style="list-style-type: none"> • \$ 87K • \$ 426K • \$ 57K
30	2007	<ul style="list-style-type: none"> • Barrington • Central Falls 	<ul style="list-style-type: none"> • \$ 85K • \$ 98K

Cap	Year	Municipality	Cost of start-up grant from RIRRC*
35	2008	<ul style="list-style-type: none"> Lincoln Smithfield Warwick 	<ul style="list-style-type: none"> \$ 101K \$ 91K \$ 394K
*The cost of the grant is calculated using 2002 figures and is based on assumptions that weight/bag = 20 lbs and cost/bag = \$0.17			

Costs incurred from the combined effect of implementing PAYT and the 35 percent municipal cap reduction are shown in the table below for 18 municipalities for 2002. A convincing argument may be made for adopting these incentives when the costs under implementation of PAYT and the 35 percent cap reduction are compared with and found to be much lower than the *real costs* for municipalities. (Real costs are calculated by internalizing the \$40/T value of landfill space). Note that while the direct costs to municipalities of PAYT with a 35% cap increases costs a modest 3%, after including \$40/T value of landfill space, the *real* cost is a dramatic 46% savings.

	Municipality	Overall Costs in 2002 figures					
		BAU costs			Real Cost (internalizing value of landfill space)		
		Baseline	35% cap rate and PAYT	%age increase or decrease	Baseline	35% cap rate and PAYT	%age increase or decrease
1.	Coventry	\$ 1,039,848	\$ 993,623	(4)	\$ 2,369,048	\$ 2,143,879	(10)
2.	Cumberland	\$ 1,359,821	\$ 1,363,824	0	\$ 2,759,501	\$ 2,563,636	(7)
3.	North Providence	\$ 1,540,368	\$ 1,672,868	9	\$ 2,912,248	\$ 2,855,508	(2)
4.	Pawtucket	\$ 2,242,948	\$ 2,467,722	10	\$ 5,005,148	\$ 4,840,642	(3)
5.	Providence	\$ 6,064,168	\$ 7,127,703	18	\$ 12,719,328	\$ 12,832,355	1
6.	Scituate	\$ 461,500	\$ 461,153	0	\$ 881,500	\$ 824,981	(6)
7.	Warren	\$ 439,200	\$ 440,576	0	\$ 919,560	\$ 854,912	(7)
8.	West Warwick	\$ 1,120,184	\$ 1,118,927	0	\$ 2,210,424	\$ 2,059,167	(7)
9.	Burrillville	\$ 950,689	\$ 1,077,406	13	\$ 1,555,009	\$ 1,600,066	3
10.	East Providence	\$ 2,100,000	\$ 2,327,917	11	\$ 3,866,160	\$ 3,856,477	0
11.	Foster	\$ 237,444	\$ 247,018	4	\$ 405,404	\$ 392,262	(3)
12.	North Smithfield	\$ 571,000	\$ 578,622	1	\$ 980,880	\$ 934,802	(5)
13.	Barrington	\$ 610,000	\$ 599,406	(2)	\$ 1,239,160	\$ 1,148,742	(7)
14.	Central Falls	\$ 746,400	\$ 883,500	18	\$ 1,391,840	\$ 1,436,600	3
15.	Cranston	\$ 4,233,152	\$ 4,033,515	(5)	\$ 7,199,112	\$ 6,598,783	(8)
16.	Lincoln	\$ 625,000	\$ 580,353	(7)	\$ 1,343,200	\$ 1,203,345	(10)
17.	Smithfield	\$ 1,024,520	\$ 1,063,035	4	\$ 1,675,280	\$ 1,628,367	(3)
18.	Warwick	\$ 3,963,504	\$ 3,207,761	(19)	\$ 6,844,184	\$ 5,717,365	(16)
	TOTAL	~ \$ 29.3 M	~ \$ 30.2 M	3	~\$ 56.3 M	~\$ 53.5M	(5)

Compulsory PAYT or Equivalent programs

Interviews with local officials have revealed an apprehension of resistance from residents that is so strong that for some municipalities even the combined incentives of start-up grants and a reduced municipal cap may be insufficient to move those communities to adopt PAYT. (Interviews by Nicholas Bayard). In this case, the State may need to mandate a user fee program. Minnesota took this step in January of 1994, with a statute requiring pricing by weight or volume as a condition for waste disposal. Although exemptions were allowed, over 1800 communities in Minnesota have now implemented some form of PAYT.³ A cut-off date should be set – probably the year the municipal cap reaches its minimum – by which time every municipality would need to have PAYT (or its equivalent) in place or be required to pay the tip fee for commercial waste for all of its waste. In the example above, PAYT would become mandatory in 2008. In order to encourage earlier participation, the RIRRC could offer start-up financial assistance only up to this date, after which municipalities will be expected to fund start-up costs from their own resources. The RIRRC also could offer more generous start-up funding for the pioneer communities. In evaluating this proposal, recall that the recycling system is based on a legislated mandate.

The sub-committee acknowledges that municipalities may be able to achieve comparable diversion rates by use of alternatives to PAYT. For example, Warwick has recently implemented an automated waste collection system which is demonstrating results that appear to be on track to achieving the targets set out above. It is therefore emphasized that municipalities are free to select and combine alternative programs, as long as these programs reach the necessary diversion from the landfill.

COMMERCIAL INCENTIVES

Strictly Enforce Commercial Recycling Regulations

Rhode Island's commercial recycling statutes and regulations⁴ require Rhode Island businesses to recycle, in part to preserve landfill disposal capacity, an important State resource. (Commercial Recycling Sub-committee). The regulations prohibit solid waste management facilities from accepting for disposal any commercial solid waste containing more than twenty percent (20%) by weight of recyclables. Unfortunately, lack of enforcement has sent a message to businesses that compliance is not a priority (Commercial Recycling Sub-committee). The Economics and Commercial Recycling sub-committees recommended that the existing commercial recycling regulations be enforced as a priority, thereby providing commercial generators and haulers with an immediate economic incentive to divert recyclables from the commercial waste stream.

³ Skumatz, Lisa A. (June 2003) "Variable Rates for Municipal Solid Waste: Implementation Experience, Economics, and Legislation." Reason Foundation Publication No. 160.

⁴ The Rules and Regulations for Reduction and Recycling of Commercial and Non-Municipal Residential Solid Waste were promulgated in September 1996 under the authorities of Chapters 23-18.8-2, 23-18.9-1, 23-18.9-7, 23-19-3, 23-19-5, 37-15, 42-17.1-2, 42-17.6, 42-20.16, and 42-35 of the Rhode Island General Laws of 1956, as amended.

Ban commercial recyclables from being landfilled

Proving that a particular waste load exceeded 20 percent by weight of recyclables was found to be difficult, and therefore the Commercial Recycling sub-committee recommended that landfill bans on commercial recyclables be adopted instead. A ban would be much easier to verify and enforce than the percentage limit and would not be problematic for several wastes that are currently required to be recycled including automobiles, white goods, vehicle batteries, used oil, and aluminum. The Commercial Recycling sub-committee recommended bans for the following: leaf and yard waste, wood wastes, office paper, cathode ray tubes, and corrugated cardboard. Presumably enforcement would be applied with discretion – only for flagrant violations.

Resource Management

The Source Reduction sub-committee recommended that Resource Management (RM) contracting be encouraged for commercial generators. Studies show that RM contracting typically reduces commercial waste generation by up to 20 percent, and increases the recycling rate by up to 14 percent (Source Reduction sub-committee).

For 2002 (in tons)	BAU	Diversion rate (20%)
Refuse	633,686	506,949
Total waste	656,685	618,664
Source Reduction	0	38,021
The figures used in this table are based on Commercial waste and recycling numbers for 2002 expected to appear in Part 5 of the new Comprehensive Solid Waste Management Plan.		

This strategy would lead to a diversion of ~127 KT from the landfill and reduced revenues of nearly \$3.8M (at the \$50.25/T average commercial tip fee, offset by \$20/T operating costs). This measure alone will increase landfill life by a little over 2 months/year – so that in 6 years, landfill life is increased by a year. Effective enforcement of a ban on disposal of commercial recyclables would provide a strong incentive for adoption of RM by commercial generators, as would a significant increase in commercial tip fees.

It has not been possible to assess the amount of commercial recyclables in the waste stream but it is generally accepted that these are a substantially higher percentage than in municipal waste, so that when measures for enforcing commercial recycling regulations and banning commercial recyclables are *combined* with RM contracting the combination will serve to extend landfill life significantly. In the case that this does not prove effective the sub-committee recommends that the following additional approach be adopted.

Divert commercial waste out-of-state

The Disposal sub-committee recommended that commercial waste be diverted out-of-state. This appears to be a viable alternative given that estimates of costs to dispose waste out-of-state are essentially equivalent to the current commercial tipping fee. The benefits of undertaking this measure *soon* cannot be overemphasized. Assuming it takes ten years to build a new landfill, 2008 is the last year waste can *begin* being diverted out-of-state in order to preserve capacity

sufficient to dispose of municipal waste to 2025 without creating landfill sites beyond those currently available.

- *Increase Commercial Tip fees*

One strategy for the RIRRC to encourage out-of-state commercial waste disposal is to increase the average commercial tip fee (currently \$50) to a rate comparable to those in adjoining states, ca. \$65/T. The anticipated result of such a pricing strategy will be that major haulers will begin to ship to less expensive landfills, in Ohio or Georgia, but smaller commercial haulers who lack the volume to afford rail-loading facilities will retain an in-state option. Note that banning commercial recyclables from the landfill, coupled with attentive enforcement of the ban would provide a further incentive for commercial waste to go out of state.

Using estimates based on the amount of commercial waste brought to the Central Landfill over the last twelve months (ending September 30, 2003), for the purposes of illustration, assume that all haulers bringing in 10 or more KT/yr will find it fiscally advantageous to ship their waste out-of-state at a \$65/T tip fee. This amounts to nearly 75 percent of the waste brought in and will divert approximately 460 KT/yr. Diversion of 460 KT from the landfill leads to reduced revenues of \$6.6M (at the \$50.25/T average commercial tip fee, offset by \$20/T operating costs and net of incoming revenue from commercial generators that stay in-state). This measure alone will increase landfill life by a little over 5.5 months a year .

Combining the municipal PAYT and shipping commercial waste out-of-state strategies, the cumulative effect is a diversion of approximately 570 KT/year. These strategies will save a little over 7 months of landfill space each year. Said a different way, these combined strategies will ***more than double*** the remaining useful lifetime of the landfill, whenever they could be implemented.

It is important to emphasize that any incentives to encourage commercial recycling will reduce income from commercial tip fees although this reduction would be partially offset by increasing the per-ton fee. At November 5, 2003 Solid Waste Management Plan Working Group Meeting, the Executive Director of the RIRRC, said that the RIRRC is prepared to accept reduced revenues if accompanied by substantial reductions in the amount of waste to be landfilled.

Value of landfill space

Ideally, the current value of landfill space would be calculated based on the cost of acquiring a site, and developing and constructing a new, sanitary landfill to be brought on-line when Central Landfill closes. The only study of which we are aware was conducted in 1991 and put the cost of total annual payments for a 630,000 tons/year capacity landfill at \$23,220,930.⁵ The study estimated that the ***additional*** tip fee required to support a new landfill was \$37/T (in 2003 figures). This would raise the tip fee to $32 + 37 = \$69$ as the tip fee at this new facility. We are unable to assess the accuracy of the 1991 cost estimate or of its continuing relevance in 2003. We note however that the cost of land has increased much more rapidly than the rate of inflation.

⁵ The figures from the study published in February 1991 have been corrected to 2003 values using 1990 as the base year.

The cost of waste disposal in neighboring states may also be used as a surrogate of the value of landfill space in Rhode Island. At a nearby landfill, the cost of land and of licensing and the political and local opposition to siting (NIMTOism and NIMBYism) arguably are similar to those in Rhode Island. For this calculation, it is assumed that privately-run landfills operate at least as efficiently as publicly operated landfills, and that disposal fees are based on the actual current value of landfill space. The estimate used here is from a landfill in Connecticut with tip fees priced at \$61/T.

This tipping fee, reduced by operating costs of \$20/T (using the RIRRC operating cost/T) gives a value of landfill space of ca. \$40/T, representing what it is worth to prevent a ton of waste from being buried. An important policy implication is that any incentive that costs up to this value may be justified as economical and should be implemented.

Note on calculation of Operating Costs

The impact of an incentive on landfill economics is calculated by estimating the amount of waste diverted by the incentive and the consequent loss in net landfill revenue. Ideally net landfill revenue/ton is calculated as the difference between tip fees/ton and the marginal operating cost (the marginal cost of disposal). The marginal cost of disposal is the cost of disposing of one additional ton of waste. It was not possible to calculate marginal costs because the cost of operations could not be disaggregated to identify which costs applied to landfill operations in particular.

In the absence of marginal costs, the average total cost of operations per ton was used. This yields a unit cost for waste disposal. As figures with regard to the total cost of operations were used it is likely that the \$20/T average cost of operations figure is inflated. It should be emphasized that generally using average costs is not accurate. *Generally*, average costs will overestimate cost increases and underestimate cost decreases – but of course there are exceptions, even to this generality.

II. New Proposals by the Economics sub-committee

RIRRC Incentive Structure

The Economics sub-committee in its Interim report found that in the short term, the RIRRC management has a direct economic **dis**-incentive to encourage source reduction or recycling, because success in either area would decrease revenues from landfilling.

One option to counteract this negative incentive faced by the Corporation, is to set a goal for the amount of waste the landfill should accept annually and require the Corporation to put aside a certain sum of money in an escrow account if this waste goal is exceeded. This could provide an incentive to the Corporation to conserve landfill space and would also build up funding for the purchase of future landfill space. This incentive would also ensure that excess profits from landfilling are reserved to fund waste diversion initiatives. The escrow fee should be set equal to the value of preventing a ton of waste from being landfilled. From the explanation above this is

ca. \$40/T. An example of a similar concept is applied in Massachusetts where landfill operators face an incentive to reduce wastes landfilled by means of a state-imposed absolute limit on daily tonnage.

Establishing an Incentive Schedule

It is essential that the incentives being recommended are coordinated and are implemented in the manner that they will be most effective. We suggest the following incentive implementation schedule be followed.

Commercial Waste

The rule-making necessary to ban the landfilling of commercial recyclables should be begun by DEM as soon as possible. Enforcement of commercial recycling regulations should start at the time that the landfilling ban regulations have been promulgated. This will send a signal that the State is serious about preserving landfill space.

The increase in contract commercial tipping fees should be announced now, to become effective after a period adequate to allow haulers to make arrangements for out-of-state disposal. (Presumably current contracts with haulers would be honored, but not extended.) RIRRC assistance to develop Resource Management programs should be announced at the same time.

Municipal Waste

Immediate notice should be given to municipalities about impending waste cap reductions beginning in 2005 with the first of the four 5 percent reductions and a leaf and yard waste ban should be announced, also effective in 2005. Legislation should be proposed to make PAYT (or equivalent waste diversion programs) mandatory statewide, beginning in 2008, enforced by setting the tip fee at the commercial rate for non-compliant municipalities after that date. If the RIRRC cannot devise a way to fund start-up costs for all communities in the same year, the availability of funding for a limited number of communities could be announced in each of the four years in which the waste reductions caps are being implemented – to be distributed first-come, first-served.

Drop glass from the list of required recyclables- We have heard testimony that container glass has little or no value, and that broken glass significantly reduces the lifetime of MRF equipment and requires greater maintenance. The presence of glass in the municipal recycling stream prevents compacting recyclables and therefore substantially raises the cost of collection and hauling for municipalities. One option to address this problem is to remove glass containers from the required recycling list. Glass is benign in the landfill, and takes up relatively little space after compaction. This strategy should reduce costs both for the municipalities (additional tip fee costs should be more than offset by reduced cost of collecting recyclables) and the MRF. Further, if glass was not being processed, the upgrade of the MRF required to handle increased recycling would be less extensive, and might not even be necessary. Of course, Rhode Island residents will need to be re-educated to stop putting glass into their blue bins, and recycling advocates might oppose this change. In response, a glass-container-only bottle bill could be

suggested which, if successful, would likely further discourage the purchase of glass containers – again benefiting the overall economics of waste management.

The elimination of glass also allows a move to *single-stream recycling*, and the Economics sub-committee recommends that this be studied seriously and promptly. Collecting all recyclables in the same compactor would dramatically reduce the cost of collecting and hauling recyclables, and increased recycling would lead directly to a cost savings for municipalities of \$32/T. The Warwick experience suggests that single-stream recycling, combined with automated collection would result in high diversion rates and reduced costs – a result well worth evaluating without delay.